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FOREST PEST MANAGEMENT

A SURVEY FOR ARMILLARIA ROOT ROT IN RED PINE PLANTATIONS ON THE SUPERIOR NATIONAL FOREST

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INTRODUCTION

Armillaria root rot (Armillaria mellea (Vahl ex Fr.) Kummer) has generally been considered a secondary pest in red pine plantations. However, in plantations that have been converted from hardwoods to pine, this disease may be more of a primary pathogen. In Wisconsin, *Armillaria* caused up to 37 percent mortality in red pine that had been planted on oak sites (Pronos and Patton 1977). Personnel from the Superior National Forest in Minnesota have expressed concern over potential losses resulting from *Armillaria* root rot in their red pine plantations. A detection survey was done in May and June, 1983 to determine the importance of *Armillaria* in red pine plantations on the Superior.

METHOD

Because tree mortality from *Armillaria* root rot is usually most severe between 5 and 10 years after plantation establishment, only plantations in that age class were sampled. A total of 35 plantations, five per Ranger District, were randomly selected for sampling (APPENDIX).

In each plantation, ten consecutive trees were sampled in every fifth row, until 100 trees were examined. Recently dead and dying trees were checked for *Armillaria* and the cause of death was determined whenever possible. Other diseases and insects were noted as they occurred.

RESULTS AND DISCUSSION

Of the 3,500 trees examined, 37 (1.1 percent) were dead or dying. *Armillaria* root rot was the primary cause of death in 11 (0.3 percent) trees and contributed to the death of 16 (0.5 percent) other trees. The remaining 10 (0.3 percent) trees were killed by mechanical damage or unidentified pests and were not infected with *Armillaria*. The highest mortality rate attributed to *Armillaria* infection (i.e., primary or secondary) was 4 percent, and it only occurred in one plantation. There was no apparent relationship between the incidence of *Armillaria* and age of the plantation.

Nineteen plantations had some hardwoods in the prior cover type, 11 were originally conifer stands, and five were previously brush or old field sites. In the latter plantations, no *Armillaria* was found. The absence of *Armillaria* on these open sites was the result of an insufficient food base (i.e., lack of tree stumps) being available for the fungus to build upon. About half the

plantations with a prior cover type of hardwoods, conifers, or a mixture of both, had Armillaria infected trees in them.

Other pest problems encountered during the survey were physiological needle droop and moose browsing. Neither problem occurred frequently enough to be of significance.

CONCLUSION

Armillaria root rot was associated with tree mortality in less than one percent of the red pine sampled. The disease does not appear to be a significant cause of mortality in 5 to 10 year old red pine plantations on the Forest. There was no apparent relationship between incidence of Armillaria and a previous cover type of conifers or hardwoods. Armillaria root rot is not likely to occur in red pine planted on sites that were not previously forested.

LITERATURE CITED

Pronos, J.; Patton, R.F. Armillaria root rot of red pine planted on oak sites in Wisconsin. Plant Dis. Repr. 61(11):955-958;1977.

APPENDIX

<u>Ranger District</u>	<u>Compartment and Stand Number</u>
Aurora	C144, S53 C200, S25 C73, S39 & 69 C75, S2 C19, S13
Gunflint	C109, S18 C27, S2 C64, S25 C140, S22 C243, S28
Isabella	C63, S40 C63, S41 C48, S11 C59, S5 C59, S7
Kawishiwi	C91, S23 C37, S103 C26, S100 C26, S101 C26, S102
LaCroix	C51, S33 C51, S42 C51, S50 C52, S3 C191, S36
Tofte	C126, S29 C126, S30 C173, S5 C16, S16 C98, S11
Virginia	C61, S4 C60, S18 C60, S38 C80, S18 C43, S18